

What is claimed is:

1. A purified protein comprising a mechanosensitive potassium channel activated by at least one polyunsaturated fatty acid and riluzole.
2. The purified protein of Claim 1 wherein the polyunsaturated fatty acid is arachidonic acid.
3. The purified protein of Claim 1 having the amino acid sequence set forth ID NO:1 or a functionally equivalent derivative thereof.
4. The purified protein of Claim 1 corresponding substantially to the amino acid sequence set forth ID NO: 2 or a functionally equivalent derivative thereof.
5. Antibodies reactive with at least one purified protein of any of Claims 1, 2 or 3.
6. The antibodies of Claim 5 wherein said antibodies are monoclonal.
7. A purified nucleic acid molecule comprising a nucleic acid sequence encoding a protein of any of Claims 1, 2 or 3.
8. The nucleic acid molecule of Claim 7 wherein said molecule comprises the sequence between nucleotides 284 to 1477 of the sequence set forth in SEQ ID NO: 1 or the complement thereof.

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9. The nucleic acid molecule of Claim 7 wherein said molecule comprises the sequence between nucleotides 484 to 1596 of the sequence set forth in SEQ ID NO: 2 or the complement thereof.

10. A vector comprising at least one purified nucleic acid molecule of Claim 7 operably linked to regulatory sequences.

11. A vector comprising at least one purified nucleic acid molecule of Claim 8 operably linked to regulatory sequences.

12. A vector comprising at least one purified nucleic acid molecule of Claim 9 operably linked to regulatory sequences.

13. A method for producing the purified protein of any of Claims 1 to 3 which comprises:

- a) transferring the nucleic acid molecule of Claim 7 into a cellular host;
- b) culturing said host under suitable conditions to produce a protein comprising a potassium channel; and
- c) isolating the protein of step (b).

14. A method for producing the purified protein of any of Claims 1 to 3 which comprises:

- a) transferring the vector of Claim 10 into a cellular host;
- b) culturing said host under suitable conditions to produce a protein comprising

a potassium channel; and

- c) isolating the protein of step (b).

15. A method for producing the purified protein of any of Claims 1 to 3 which comprises:

- a) transferring the nucleic acid molecule of Claim 8 into a cellular host;
- b) culturing said host under suitable conditions to produce a protein comprising

a potassium channel; and

- c) isolating the protein of step (b).

16. A method for producing the purified protein of any of Claims 1 to 3 which comprises:

- a) transferring the vector of Claim 11 into a cellular host;
- b) culturing said host under suitable conditions to produce a protein comprising

a potassium channel; and

- c) isolating the protein of step (b).

17. A method for producing the purified protein of any of Claims 1 to 3 which comprises:

- a) transferring the nucleic acid molecule of Claim 9 into a cellular host;
- b) culturing said host under suitable conditions to produce a protein comprising

a potassium channel; and

- c) isolating the protein of step (b).

18. A method for producing the purified protein of any of Claims 1 to 3 which comprises:

- a) transferring the vector of Claim 12 into a cellular host;
- b) culturing said host under suitable conditions to produce a protein comprising

a potassium channel; and

- c) isolating the protein of step (b).

19. A method for expressing a potassium channel of any of Claims 1 to 3 which comprises:

- (a) transferring the purified nucleic acid molecule of Claim 5 into a cellular host;

and

- (b) culturing said host under suitable conditions for expressing the potassium channel.

20. A method for expressing a potassium channel of any of Claims 1 to 3 which comprises:

- (a) transferring the vector of Claim 10 into a cellular host; and
- (b) culturing said host under suitable conditions for expressing the potassium channel.

21. A method for expressing a potassium channel of any of Claims 1 to 3 which comprises:

- (a) transferring the purified nucleic acid molecule of Claim 6 into a cellular host; and
- (b) culturing said host under suitable conditions for expressing the potassium channel.

22. A method for expressing a potassium channel of any of Claims 1 to 3 which comprises:

- (a) transferring the vector of Claim 11 into a cellular host; and
- (b) culturing said host under suitable conditions for expressing the potassium channel.

23. A method for expressing a potassium channel of any of Claims 1 to 3 which comprises:

- (a) transferring the purified nucleic acid molecule of Claim 7 into a cellular host; and
- (b) culturing said host under suitable conditions for expressing the potassium channel.

24. A method for expressing a potassium channel of any of Claims 1 to 3 which comprises:

- (a) transferring the vector of Claim 12 into a cellular host; and
- (b) culturing said host under suitable conditions for expressing the potassium

channel.

25. A cellular host produced by the method of Claim 19.

26. A cellular host produced by the method of claim 20.

27. A cellular host produced by the method of claim 21.

28. A cellular host produced by the method of Claim 22.

29. A cellular host produced by the method of Claim 23.

30. A cellular host produced by the method of Claim 24.

31. A method for screening substances capable of modulating the activity of the purified protein of any of Claims 1 to 3 which comprises:

(a) reacting varying amounts of the substance to be screened with the cellular host of Claim 19; and

(b) measuring the effect of the substance to be screened on a potassium channel expressed by the cellular host.

32. A method for screening substances capable of modulating the activity of the purified protein of any of Claims 1 to 3 which comprises:

(a) reacting varying amounts of the substance to be screened with the cellular host of Claim 20; and

5 (b) measuring the effect of the substance to be screened on a potassium channel expressed by the cellular host.

33. A method for screening substances capable of modulating the activity of the purified protein of any of Claims 1 to 3 which comprises:

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(a) reacting varying amounts of the substance to be screened with the cellular host of Claim 21; and

(b) measuring the effect of the substance to be screened on a potassium channel expressed by the cellular host.

34. A method for screening substances capable of modulating the activity of the purified protein of any of Claims 1 to 3 which comprises:

(a) reacting varying amounts of the substance to be screened with the cellular host of Claim 22; and

5 (b) measuring the effect of the substance to be screened on a potassium channel expressed by the cellular host.

35. A method for screening substances capable of modulating the activity of the purified protein of any of Claims 1 to 3 which comprises:

(a) reacting varying amounts of the substance to be screened with the cellular host of Claim 23; and

(b) measuring the effect of the substance to be screened on a potassium channel expressed by the cellular host.

36. A method for screening substances capable of modulating the activity of the purified protein of any of Claims 1 to 3 which comprises:

(a) reacting varying amounts of the substance to be screened with the cellular host of Claim 24; and

(b) measuring the effect of the substance to be screened on a potassium channel expressed by the cellular host.

37. The process of any of Claims 31-36 wherein said process screens substances capable of preventing or treating heart disease in mammals.

38. The process of any of Claims 31-36 wherein said process screens substances capable of preventing or treating central nervous system disease in mammals.

39. A method for preventing or treating heart disease in mammals which comprises administering a therapeutically effective amount of a pharmaceutical composition comprising a therapeutically effective amount of a substance capable of modulating the activity of the purified protein of any Claims 1 to 3.



40. A method for preventing or treating central nervous system disease in mammals which comprises administering a therapeutically effective amount of a pharmaceutical composition comprising a therapeutically effective amount of a substance capable of modulating the activity of the purified protein of any Claims 1 to 3.

41. The method of Claim 39 wherein said method is useful for preventing or treating cardiac pathologies and vascular diseases.

42. The method of Claim 40 wherein said method is useful for preventing or treating neurodegenerative diseases.

43. A pharmaceutical composition comprising a therapeutically effective amount of at least one purified protein of any of Claims 1 to 3 and a pharmaceutically acceptable carrier.

44. A pharmaceutical composition comprising a therapeutically effective amount of at least one antibody of Claim 5 and a pharmaceutically acceptable carrier.

45. A pharmaceutical composition comprising a therapeutically effective amount of at least antibody of Claim 6 and a pharmaceutically acceptable carrier.

46. A pharmaceutical composition comprising a therapeutically effective amount of at least one purified nucleic acid molecule of Claim 7 and a pharmaceutically acceptable carrier.

47. A pharmaceutical composition comprising a therapeutically effective amount of at least one purified nucleic acid molecule of Claim 8 and a pharmaceutically acceptable carrier.

48. A pharmaceutical composition comprising a therapeutically effective amount of at least one purified nucleic acid molecule of Claim 9 and a pharmaceutically acceptable carrier.

49. A pharmaceutical composition comprising a therapeutically effective amount of at least one vector of Claim 10 and a pharmaceutically acceptable carrier.

50. A pharmaceutical composition comprising a therapeutically effective amount of at least one vector of Claim 11 and a pharmaceutically acceptable carrier.

51. A pharmaceutical composition comprising a therapeutically effective amount of at least one vector of Claim 12 and a pharmaceutically acceptable carrier.